IN THE CLAIMS:

Claims 1 - 26 (**canceled**).

27. (**NEW**): A method of imaging a portion of the aorta of a patient using a magnetic resonance imaging system, the method comprising:

determining an arrival time of a test bolus in a region of interest;

correlating an administration of a magnetic resonance contrast agent with an acquisition of magnetic resonance image data, including image data which is representative of the center of k-space, using the arrival time of the test bolus;

administering the magnetic resonance contrast agent to the patient; and

acquiring the magnetic resonance image data using a 3D pulse sequence, wherein the image data which is representative of the center of k-space is acquired while the concentration of the contrast agent in the portion of the aorta is greater than a concentration of the contrast agent in veins and background tissue adjacent to the portion of the aorta.

28. (**NEW**): The method of claim 27 wherein acquiring magnetic resonance image data further includes using a flip angle which is greater than about 30° and less than or equal to about 90°.

29. (**NEW**): The method of claim 27 wherein acquiring magnetic resonance image data further includes using a TR which is less than about 10 milliseconds and a TE which is less than about 3 milliseconds.

30. (**NEW**): The method of claim 27 wherein acquiring magnetic resonance image data further includes acquiring a substantial portion of the image data which is representative of the central portion of k-space while the patient suspends respiration.

31. (**NEW**): The method of claim 27 further including correlating the acquisition of the image data which is representative of the center of k-space with the suspension of respiration by the patient.

32. (**NEW**): The method of claim 27 further including imaging at least one renal artery of the patient by acquiring magnetic resonance image data, of a coronally oriented image volume including the renal artery wherein the image data being acquired while the concentration of the contrast agent in the renal artery is substantially greater than a concentration of the contrast agent in veins and background tissue adjacent to the artery.

33. (**NEW**): The method of claim 27 further including imaging at least one renal artery of the patient by acquiring magnetic resonance image data including image data which is representative of the center of k-space while the concentration of the contrast agent in the renal artery is substantially greater than a concentration of the contrast agent in veins and background tissue adjacent to the artery.

34. (**NEW**): The method of claim 34 wherein imaging at least one renal artery of the patient further includes collecting 3D phase contrast images.

35. (**NEW**): The method of claim 27 wherein the image volume of the 3D pulse sequence includes at least one dimension which is greater than 25 cm.

36. (**NEW**): The method of claim 27 further including:

collecting image data of a pre-contrast image data set including collecting image data before administering a substantial amount of the magnetic resonance contrast agent to the patient; and

constructing an image of the portion of the aorta by subtracting the image data of the pre-contrast image data set from the image data acquired while the concentration of the contrast agent in the portion of the aorta is greater than a concentration of the contrast agent in veins and background tissue adjacent to the portion of the aorta.

37. (**NEW**): The method of claim 27 further including acquiring image data of the periphery of k-space while the concentration of the contrast agent in the aorta is greater than a concentration of the contrast agent in veins and background tissue adjacent to the aorta.

38. (**NEW**): A method of imaging an artery of a patient using a magnetic resonance imaging system, the method comprising:

determining an arrival time of a magnetic resonance contrast agent in a region of interest wherein the region of interest includes the artery;

correlating an injection of the magnetic resonance contrast agent to the patient with a collection of magnetic resonance image data using the arrival time of the magnetic resonance contrast agent in the region of interest;

injecting the magnetic resonance contrast agent to the patient; and

collecting the magnetic resonance image data using a 3D pulse sequence, wherein collecting magnetic resonance image data includes collecting a substantial portion of the image data while the concentration of the contrast agent in the artery is greater than a concentration of the contrast agent in veins and background tissue adjacent to the artery.

39. (**NEW**): The method of claim 38 wherein the arrival time of the magnetic resonance contrast agent is an estimated arrival time.

40. (**NEW**): The method of claim 38 further including correlating collection of magnetic resonance image data which is representative of the center of k-space with the arrival time of the contrast agent in the region of interest.

41. (**NEW**): The method of claim 38 wherein determining the arrival time of a magnetic resonance contrast agent in the region of interest includes using a test bolus.

42. (**NEW**): The method of claim 38 further including correlating the suspension of the respiration of the patient with the collecting magnetic resonance image data.

43. (**NEW**): The method of claim 42 wherein correlating the suspension of the respiration of the patient with the collecting magnetic resonance image data includes collecting a substantial portion of the image data which is representative of the center of k-space while the patient suspends respiration.

44. (**NEW**): The method of claim 42 wherein collecting magnetic resonance image data further includes using a TR which is less than about 10 milliseconds, a TE which is less than about 7 milliseconds, and a flip angle which is between about 30° and about 90°.

45. (**NEW**): The method of claim 38 further including imaging at least one renal artery of the patient by collecting image data which is representative of the center of k-space while the concentration of the contrast agent in the renal artery is greater than a concentration of the contrast agent in veins and background tissue adjacent to the artery.

46. (**NEW**): The method of claim 38 wherein collecting magnetic resonance image data further includes using a slice thickness which is less than about 4 millimeters and the image volume of the 3D pulse sequence includes at least one dimension which is at least about 25 centimeters.

47. (**NEW**): The method of claim 38 wherein collecting magnetic resonance image data further includes collecting image data of the periphery of k-space while

the concentration of the contrast agent in the artery is greater than a concentration of the contrast agent in veins and background tissue adjacent to the artery.

48. (**NEW**): The method of claim 38 wherein determining the arrival time of a magnetic resonance contrast agent in the region of interest includes estimating the arrival time based on the physical condition of the patient or the location of the artery in the patient.

49. (**NEW**): A method of imaging an artery of a patient using a magnetic resonance imaging system, the method comprising:

calculating an arrival time of the contrast agent in the region of interest;

injecting a magnetic resonance contrast agent to the patient;

correlating collection of magnetic resonance image data which is representative of the center of k-space with the injection of the magnetic resonance contrast agent using the arrival time of the contrast agent in the region of interest;

collecting magnetic resonance image data, including the image data which is representative of the center of k-space, using a 3D pulse sequence, wherein at least a portion of the image data is collected while the concentration of the contrast in the artery is greater than a concentration of the contrast agent in veins and background tissue adjacent to the artery.

50. (**NEW**): The method of claim 49 wherein calculating the arrival time of the contrast agent in a region of interest includes using a test bolus.

51. (**NEW**): The method of claim 49 wherein collecting magnetic resonance image data includes collecting a substantial portion of the image data while the patient suspends respiration.

52. (**NEW**): The method of claim 49 wherein collecting magnetic resonance image data further includes using a TR which is less than about 10 milliseconds.

53. (**NEW**): The method of claim 49 further including imaging at least one renal artery of the patient by collecting magnetic resonance image data using a 3D pulse sequence, the image data being collected while the concentration of the contrast agent in the renal artery is greater than a concentration of the contrast agent in veins and background tissue adjacent to the renal artery.

54. (**NEW**): The method of claim 49 wherein calculating the arrival time of a magnetic resonance contrast agent in the region of interest includes calculating the arrival time based on the physical condition or age of the patient.

55. (**NEW**): The method of claim 49 further including instructing the patient to suspend respiration while collecting the magnetic resonance image data which is representative of the center of k-space.

56. (**NEW**): The method of claim 49 wherein collecting magnetic resonance image data includes collecting image data which is representative of the periphery of k-space immediately after collecting image data which is representative of the center of k-space.